2006 GOOSE STATUS

Canada geese that migrate to Missouri include birds from 4 different populations. Tallgrass Prairie Population Canada geese (cackling geese) migrate from near the Arctic Circle on Baffin Island, the Eastern Prairie and Mississippi Valley populations originate from west Hudson Bay in northern Manitoba and Ontario, and giant Canada geese nest in more temperate areas including Missouri. Geese from different populations survive, reproduce, and are harvested at different rates. Each population experiences different breeding conditions each year. As a result, population-specific information is needed to assess annual status and to develop appropriate regulations recommendations.

Eastern Prairie Population:

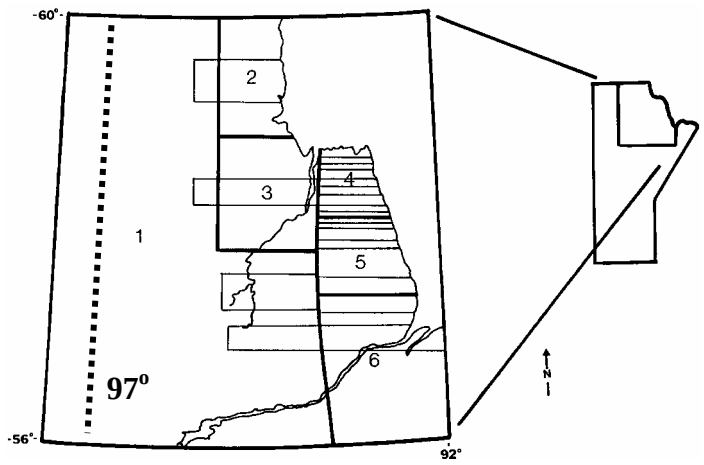
The Eastern Prairie Population (EPP) of Canada geese nests in northern Manitoba and primarily migrates/winters through Manitoba, Minnesota, Iowa, Missouri, and Arkansas (Figure 7). Annual regulations and management decisions are based on plan objectives and results from the EPP breeding ground survey.

Figure 7. EPP range and migration areas.

Surveys of the EPP have been conducted since 1972 and reflect population and nesting effort (Figure 8). Geese observed on the survey consistently have been recorded as singles, pairs, groups, and numbers of geese per group, and singles or pairs with nests or broods. Estimates of numbers of geese among these components reflect changing EPP composition among years.

Breeding phenology in 2006 was early range-wide. This represents the second year of early to average conditions after the record late spring of 2004. Brian Lubinski (USFWS, pilot), John Wollenberg (Minnesota DNR, observer), and Andy Raedeke (Missouri Dept. Cons., observer) conducted the aerial survey on 22 May -1 June. The survey has started earlier than 23 May only twice, in 1972 and 1973.

Figure 8. EPP survey strata and transects in Manitoba.



May 2006 temperatures (0.8°C) were slightly above average (-0.7°C, 1972-

2004). Heating-degree days in May (532, Figure 3) were below the 1972-2004 average of 584 heating degree days (Figure 4). Although May temperatures and heating degree days were near normal, below average winter snow fall and mild conditions in April contributed to an early spring breakup. Virtually no snow remained at the time of the survey and most lakes were open with the exception of the northern portion of the range where some large lakes were still ice covered. Vegetation, especially in the southern portion of the range, changed notably over the duration of the survey. At the time of completion, aspens had leafed out, tamaracks were budding, and sedge meadows had greened up considerably. Below average snowfall, coupled with an earlier than normal snowmelt, resulted in drier than average conditions. Large lakes and rivers appeared to be slightly below normal.

Figure 9. Heating degree days during May 2006 & 2005, vs. normal.

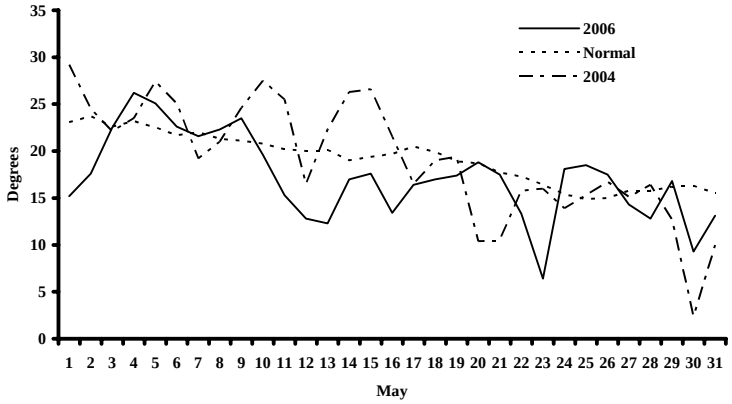
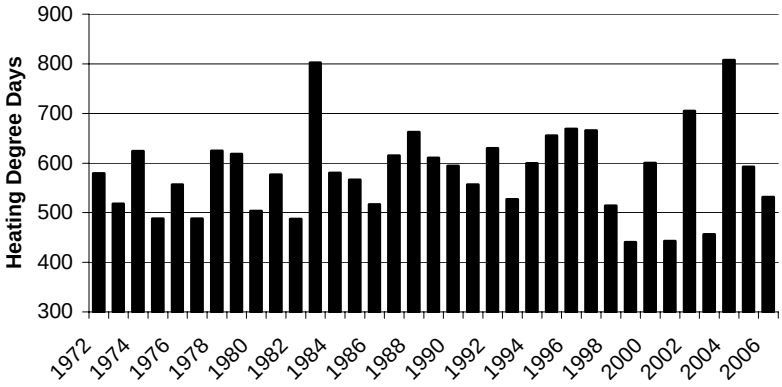


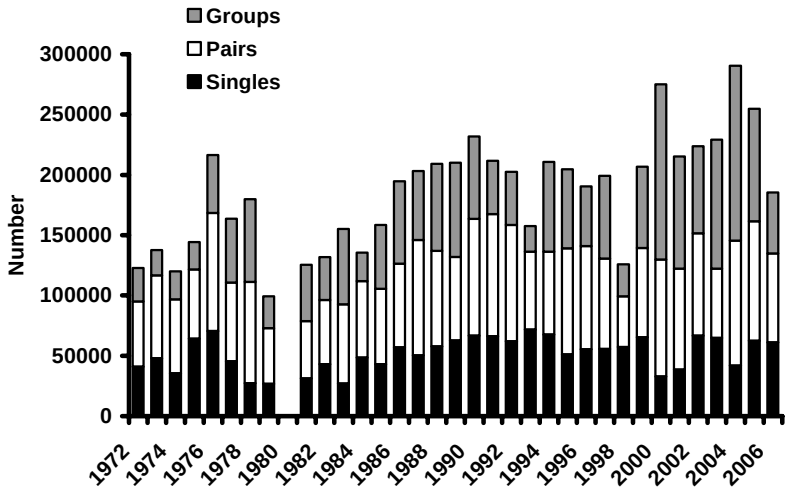
Figure 10. May heating degree days by year at Churchill, Manitoba.



Total EPP: The 2006 EPP estimate of 185,400 ± 30,400 geese is lower (P=0.002, 2-tailed Z test) than the 2005 estimate of 254,700 ± 30,900 (Figure 11).

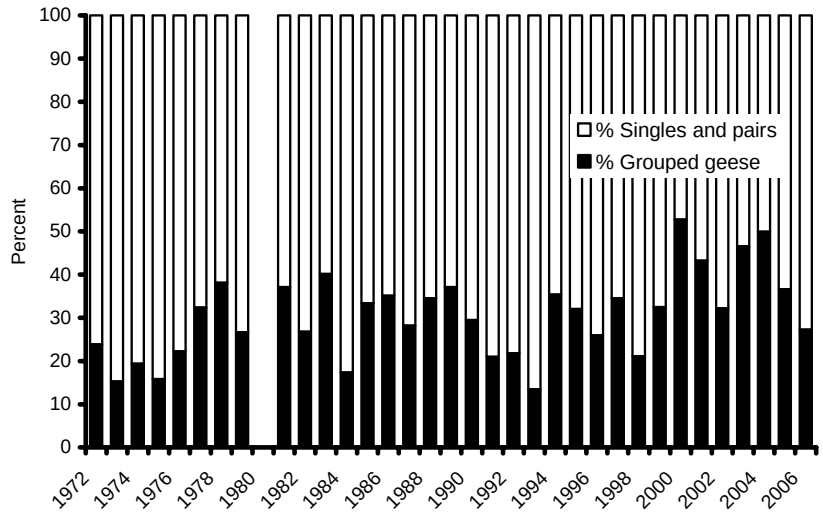
Geese in groups: The lower overall number of EPP Canada geese was mainly the result of fewer geese observed in groups. The estimate of 50,600 ± 25,900 geese observed in groups represents a substantial decline (P=0.019) from 2005 (93,200 ± 24,700) and the record high of 145,200 ± 32,300 in 2004. It is the second lowest estimate in the last 10 years (Figure 11). Grouped geese accounted for 27% of the EPP population in 2006 compared to the range of 32-53% from 2000-2004 and 15-37% from 1972-1999 (Figure 12).

Figure 11. Numbers of EPP geese represented by singles, pairs, and groups.



During recent years, the presence of molt migrant giant Canada geese has confounded interpretation of breeding ground survey results. We observed fewer molt migrants in 2006, due to the earlier survey timing. The earlier timing of this year's survey likely reduced the presence of molt migrant geese. The coastal estimate (41,400 ± 25,400) was similar (P=0.615) to 2005 (49,400 ± 18,000), but down from the record high of 90,900 ± 26,300 in 2004. In contrast, the interior estimate declined from 43,800 ± 17,000 in 2005 to 9,100 ± 5,200 in 2006 (P<0.001), the lowest estimate since 1993 (9,200 ±6,400). Based on guidelines in the 2000 EPP Plan, larger groups in interior strata (>15 geese/group – most likely giant Canada geese or interior Canada geese from other populations, e.g., MVP, Southern James Bay Population (SJBP) were excluded from EPP estimates. We observed three groups >15 in interior habitats in 2006 (18,22,25) and excluded them from the EPP estimate.

Figure 12. Proportion of the EPP in groups versus singles plus pairs, 1972-2006



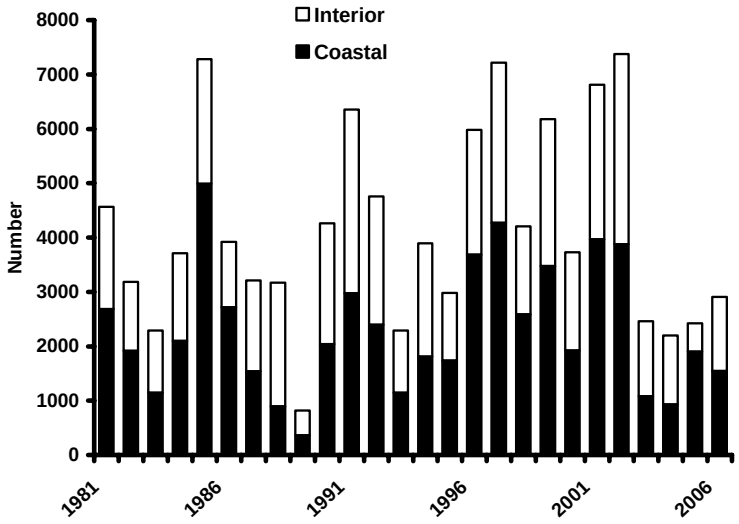
Singles: The 2006 estimate of singles (61,000 ± 9,500) is comparable to 2005 (62,500 ± 9,500) (P=0.832), and one of the highest estimates within the last 10 years (32,800-66,800). Both coastal (38,600 ± 7,600) and interior (22,500 ± 5,800) estimates remain essentially unchanged from 2005 (40,000 ± 7,100 coastal and 22,500 ± 6,600 interior).

Pairs: The estimate of 73,800 ± 12,600 geese observed in pairs is lower (P=0.015) than 2005 (99,100 ± 15,800), but within the range of the previous 10 years (57,600 – 103,600). Numbers in coastal (35,400 ± 8,800) and interior habitats (38,300 ± 9,000) are similar to those in 2005 (48,200 ± 10,600, P=0.072 and 50,900 ± 11,700, P=0.095, respectively).

Singles and pairs: Pairs plus singles likely include geese actively nesting in the current year as well as those likely to nest in the near term. This year's estimate of 134,800 ± 18,700 is similar (P=0.064) to last year's estimate of 161,600 ± 21,100, and within the range of the previous 20 years (99,300 – 167,400). The 2006 coastal estimate (74,000 ± 14,800) is similar (P=0.193) to the 2005 estimate (88,200 ± 15,400), as is the interior estimate (60,800 ± 11,500 vs.73,400 ± 14,400 in 2005, P=0.183).

Productive Geese: We believe numbers of geese nesting are best reflected by a combination of single geese, pairs seen with nests or broods, and geese initially observed as a single (e.g., goose flushed from a nest) and joined by another bird (likely the gander). Numbers of productive geese (72,000 ± 11,600) remained similar (P=0.895) to 2005 (73,000 ± 10,700). The 2006 coastal (45,300 ± 9,400) and interior (26,600 ± 6,600) estimates are unchanged from 2005 (48,600 ± 8,200 and 24,400 ± 7,000, respectively).

Figure 13. Number of EPP nests and broods in coastal and interior habitats, 1981-2006



Although we did not observed any geese with broods in 2006, our estimate of geese on nests (2,900 ± 1,100) was within the range observed in the past (Figure 13). Nesting effort also is indicated by the count of nests observed during transects (52 in 2006 vs. the 2000-2005 range of 32-126) and during low-level surveys near the Hudson Bay coast (n=78, 0.74 nests/mile in 2006 vs. the 1979-2005 range of 0.28 – 1.08 nests per mile). From 1991-2005, nest density along the coast was only higher than 2006 in 1991 (0.83), 1997 (0.83) 1998 (1.08), and 2001 (0.85). The average clutch size of 4.1 along the coast also point to above average production.

Despite a decline in the overall EPP estimate, the numbers of singles and pairs, combined with production indices, suggest that 2006 may culminate in the second consecutive year of above average production. The reduction in the overall population estimate is the result of the lower numbers of geese observed in groups, and to a lesser extent, observed in pairs. The presence of fewer molt migrant giant Canada geese, due to the early survey timing, likely contributed to the decline in numbers of geese observed in groups. The reduction in the number of pairs may be the consequence of the "bust" in production in 2004. We project a fall flight similar to 2005, with a similar proportion of young geese.

Mississippi Valley Population:
Spring 2006 was exceptionally early on the MVP breeding grounds. The estimated 2006 breeding population of 384,353 is the highest recorded since 1999 and is 6% above the 1989-2006 average. Nest densities were slightly above average. The 2006 spring population estimate of 704,954 is 8% above the 1989-2006 average. Production is expected to be good, and the fall flight should be similar to 2005 and include a high proportion of young birds.

Tallgrass Prairie Population:
The Tallgrass Prairie Population is comprised of small geese that have recently undergone a name change and are now referred to as cackling geese by the American Ornithologists' Union. Cackling geese are much smaller than Canada geese that nest in Missouri. Most cackling geese that migrate through Missouri nest on Baffin Island and winter in Louisiana, Oklahoma, Texas and northeastern Mexico. Missouri is on the eastern edge of their migration route. Because they nest in the high arctic, production is often affected by weather and late snow melt. Limited information suggests that spring breakup during 2006 was average on Baffin Island. Based upon this limited information, the fall flight is expected to be similar to or higher than 2005.

Table 5. Spring population estimate of giant Canada geese in the Mississippi Flyway and Missouri.

Year	Mississippi Flyway	Missouri
1993	810,900	30,300 (± 18,000)
1994	1,002,950	35,050 (±19,400)
1995	1,030,600	32,200 (±14,200)
1996	1,132,354	38,870 (±19,530)
1997	1,038,677	41,020 (±22,860)
1998	1,214,798	44,825 (±8,816)
1999	1,234,096	56,750 (±10,987)
2000	1,497,444	77,128 (±27,710)
2001	1,370,967	50,517 (±14,934)
2002	1,612,349	64,222 (±24,045)
2003	1,631,003	62,806 (±19,519)
2004	1,582,200	65,172 (±29,976)
2005	1,580,000	53,487 (±21,985)
2006	1,686,300	64,593 (±20,220)

Giant Canada Geese:
Giant Canada geese are native to prairie portions of the Upper Midwest and were common in portions of Missouri during pre-settlement times. Giant Canada geese were thought to have become extinct by the late 1800s but have now been restored to most of the eastern United States.

Six states in the Mississippi Flyway developed and implemented a breeding population survey beginning in 1993. This survey requires the use of helicopters to conduct low level counts on randomly selected 2-square mile plots. Additional states cooperate in the survey using fixed wing aircraft, ground counts, or extrapolations from known density areas to habitats in non-surveyed areas. An initial Mississippi Flyway estimate of 810,900 giant Canada geese in 1993, increased to a high of 1.69 million in spring 2006 (Table 5). Estimates of giant Canada geese in

the Mississippi Flyway have been increasing an average of 5% a year since 1997. These estimates are considered conservative due to the inability to survey some urban locations. Based on the survey we flew in Missouri from April 3, 5-6, and 11-12, Missouri's Canada goose population is 64,593 (±20,220), which is similar to 2005 (53,487 ±21,985), and within the range observed since 2000 (50,517 – 77,128, Table 5). The population estimate for Missouri increased from 30,300 in 1993 to a high of 77,128 in 2000 but appears to have leveled off since. Control activities and harvest regulations focusing on giant Canada geese, or other unknown factors, appear to have reduced giant Canada goose population growth rate in Missouri since 2000.

Table 6. Results of the 2006 giant Canada goose survey in Missouri.

Stratum	# Plots flown	# Plots included	geese per plot	Prs	PN	S	SN	Geese in Groups	Total	Est. # geese per stratum (2005)
High	10	10	9.0	15	3	1	0	53	90	7,587 (4,468)
Medium	28	29	4.5	25	2	12	0	65	131	20,115 (26,257)
Low	93	105	1.59	34	9	8	3	70	167	36,891 (22,761)
Total	131	143	2.71	74	14	21	3	188	388	64,593 (53,487)

We randomly selected a total of 150 random 2-square mile plots and surveyed 131 of them. The survey required approximately 35 helicopter hours. The plots included 93 in a low density, 28 in a medium density, and 10 in a high density stratum. We excluded the forested hills of southeast Missouri where few or no geese are known to be present, an area with 6,347 potential plots. We did not fly 17 low density plots; 12 because we identified little or no water on topographic maps and five were too far for the time and fuel to allow. We assumed the 12 plots without water had zero geese and included them in the estimate as if they were flown but no geese were present. A summary, by strata, of the area and number of plots flown, and the break-down by breeding status (pairs, pairs w/nests, singles, singles with nests, and geese in groups) is shown in Table 6. We observed a mean of 9.0, 4.5, and 1.6 geese per plot in high, medium and low density plots, respectively. The estimated (expanded) number of geese present for each stratum is also shown in table 1.

Banding: Operational banding of giant Canada geese is conducted annually in Missouri. Banding data is used to evaluate the effects of regulations and to determine the source and distribution of the Missouri Canada goose harvest.

Canada goose roundups were conducted during the last half of June and a total of 3,581 geese were captured (Table 7). Of these, 1,821 were banded and released, and band numbers on 1,760 "recaptures" were recorded before they were released. The ratio of immature to adults was 0.13.

Table 7. Results of Canada goose roundups in Missouri – June, 2006.

Area	Banded & Released				Total Banded	Retakes	Total Captured
	AM	AF	LM	LF			
St. Louis	186	192	71	86	535*	409	944**
Taneycomo	23	17	13	11	64	187	251
Pony Express	140	115	4	7	266	300	566
Central MO	51	20	54	35	160	140	300
Smithville Lake	186	170	26	55	437	418	855
Southeast MO	50	38	19	23	130	83	213
Kansas City (Harrisonville)	118	108	1	2	229	223	452
Total	754	660	188	219	1,821	1,760	3,581

Giant Canada Goose Control Activities: Canada goose control activities are conducted from spring through August and results for 2006 are not yet available. The following information is a summary of control activities that occurred during 2005.

Canada goose population control activities were conducted for the 5th year under a Special Purpose Canada Goose Permit issued to the Missouri Department of Conservation (MDC). This permit allows MDC to issue "sub-permits" to private citizens (who have suffered property damage by Canada geese) to destroy nests, to carry out lethal control of adult Canada geese, and to transport hatching year birds to a designated location to be released.

A total of 735 nests (4,040 eggs) were treated to prevent recruitment into the local population and a total of 741 adult geese were destroyed. Adult geese were transported to a meat processing plant to be donated to a food bank. Seventeen juvenile year birds were transported from damage sites to a rural location and released. Results of damage control activities during 2005, compared with past years, are shown in Table 8.

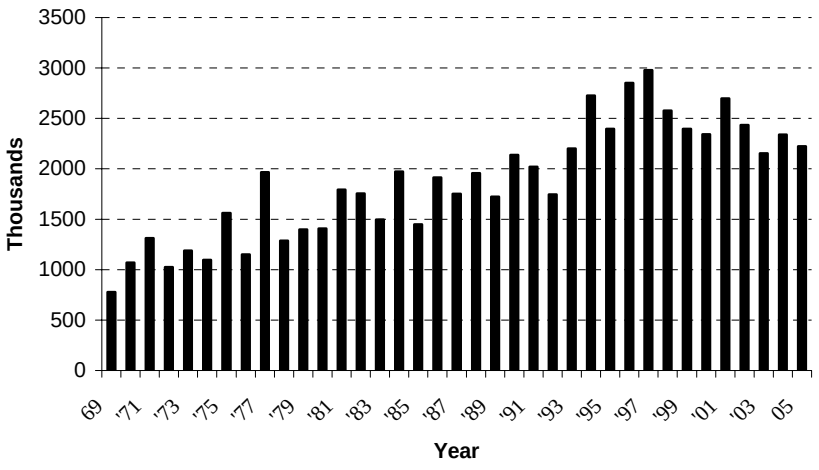
Table 8. MDC 2005 goose permits - total by region.

Region	Eggs Destroyed	Nests Destroyed	Geese Destroyed	Geese Relocated
Northwest	65	12	0	0
Northeast	0	0	0	0
Kansas City	888	170	411	5
St. Louis	2,380	427	57	2
Southwest	54	11	2	0
Ozark	0	0	0	0
Central	585	101	45	3
Southeast	54	11	2	0
2005 Totals	**4,040**	**735**	**741**	**17**
2004 Totals	3,655	699	435	77
2003 Totals	4,434	832	525	48
2002 Totals	4,289	802	464	68
2001 Totals	3,885	772	262	64

White-Fronted Geese:
The Mid-Continent Population (MCP) of greater white-fronted geese nests across a broad region of the arctic from Alaska to the Foxe Basin. They stage in southern Saskatchewan and Alberta during migration and winter primarily in Texas, Louisiana, and Mexico. Mississippi and Central Flyway cooperators conducted the 2005 fall survey of MCP white-fronted geese in Alberta and Saskatchewan during late September and estimated a population of 522,800 geese, a decrease of 19% from fall 2004. The population of MCP white-fronted geese appears to have declined by about 5% per year since 1996. Harvest regulations are based on a three-year running average. The 2005 survey resulted in a new 3-year (2002-2005) average of 565,100 geese, 8.5% below the previous three-year mean of 617,600 birds. Overall, production of white-fronted geese is expected to be average to above average during spring 2006 and the fall flight is expected to be lower than fall 2005.

Light Geese:
The term light geese includes snow (blue and white color phase) and Ross's geese. The Mid-Continent Population (MCP) of light geese includes breeding colonies on Baffin and South Hampton Island and along the west coast of Hudson Bay. This population is the primary source of lesser snow geese present in Missouri during fall through winter. However, light geese from throughout the arctic may be present especially during spring migration. Although lesser snow geese are more common, increasing numbers of Ross's geese have been noted in Missouri and the Mississippi Flyway in recent years. This appears to be due to an increase in numbers of Ross's geese throughout their range and to increased numbers of nesting Ross's geese in the eastern arctic. Early spring conditions on Baffin Island are expected to result in above average nesting efforts at this large colony. Average or earlier than average snowmelt at South Hampton Island and along the west coast of Hudson Bay is expected to result in average to above average snow goose production from these areas as well. Overall, production of light geese is expected to be similar or higher than in 2005.

Figure 14. Midwinter survey estimates of the Mid-Continent Population of light geese.



The 2005-06 Midwinter Waterfowl Survey resulted in an estimate of 2,221,700 MCP light geese, which is 5% lower than the previous year (Figure 14). After peaking at nearly 3 million in 1998, the light geese population appears to have declined by about 3% per year.